
PART O
WALKING WORKING SURFACES; FIXED INDUSTRIAL STAIRS; AERIAL MANLIFTS

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WAC 296-307-250 Walking working surfaces, elevated walkways, and platforms.

[Recodified as § 296-307-250. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-250, filed 10/31/96, effective 12/1/96.]

WAC 296-307-25003 What definitions apply to this section?

“Floor hole” means an opening with the smallest dimension between one and 12 inches, in any floor, platform, pavement, or yard, through which materials may fall but not people. Examples are a belt hole, pipe opening, or slot opening.

“Floor opening” means an opening with the smallest dimension of 12 inches or more, in any floor, platform, pavement, or yard, through which people may fall. Examples are a hatchway, stair or ladder opening, pit, or large manhole. Floor openings occupied by elevators, dumb waiters, conveyors, machinery, or containers are excluded from this definition.

WAC 296-307-25003 (Cont.)

“Handrail” means a single bar or pipe supported on brackets from a wall or partition to furnish persons with a handhold in case of tripping.

“Platform” means a working space for people that is elevated above the surrounding floor or ground, such as a balcony or platform for the operation of machinery and equipment.

“Runway” means a passageway used by people that is elevated above the surrounding floor or ground level, such as a footwalk along shafting or a walkway between buildings.

“Standard railing” means a vertical barrier along exposed edges of a floor opening, wall opening, ramp, platform, or runway to prevent people from falling.

“Standard strength and construction” means any construction of railings, covers, or other guards that meets the requirements of this section.

“Stair railing” means a vertical barrier along exposed sides of a stairway to prevent people from falling.

“Toeboard” means a vertical barrier at floor level along exposed edges of a floor opening, wall opening, platform, runway, or ramp to prevent materials from falling.

“Wall hole” means an opening between one and 30 inches high, of any width, in any wall or partition, such as a ventilation hole or drainage scupper.

“Wall opening” means an opening at least 30 inches high and 18 inches wide, in any wall or partition, through which people may fall, such as a yard-arm doorway or chute opening.

[Recodified as § 296-307-25003. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-25003, filed 10/31/96, effective 12/1/96.]

WAC 296-307-25006 When may railings be omitted? Railings may be omitted from sections of open-sided floors, platforms, or walkways where guard rails impair operations, if railings are replaced when they no longer impair operations.

[Recodified as § 296-307-25006. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-25006, filed 10/31/96, effective 12/1/96.]

WAC 296-307-25009 What protection must an employer provide for floor openings?

- (1) Every stairway floor opening must be guarded by a standard railing constructed according to this section. The railing must guard all exposed sides (except the entrance to the stairway). Infrequently used stairways where traffic across the opening prevents using a fixed standard railing (as when located in aisle spaces, etc.), may use an alternate guarding method. In these cases, the guard must have a hinged floor opening cover of standard strength and construction and removable standard railings on all exposed sides (except at the entrance to the stairway).
- (2) Every ladderway floor opening or platform must be guarded by a standard railing with standard toeboard on all exposed sides (except at the entrance to the opening). The passage through the railing must have either a swinging gate or offset so that a person cannot walk directly into the opening.
- (3) Every hatchway and chute floor opening must be guarded by one of the following:
 - (a) A hinged floor opening cover of standard strength and construction with standard railings, or a permanent cover with only one side exposed. When the opening is not in use, the cover must be closed or the exposed side must be guarded at both the top and middle by removable standard railings.

WAC 296-307-25009 (Cont.)

- (b) A removable railing with toeboard on a maximum of two sides of the opening and with fixed standard railings and toeboards on all other exposed sides. The removable railings must be kept in place when the opening is not in use and should be hinged or mounted to be easily replaced.
- (4) When employees must feed material into any hatchway or chute opening, you must provide protection to prevent people from falling through the opening.
- (5) When practical, the area under floor openings must be fenced off. Otherwise, the area must be plainly marked with yellow lines and telltales hanging within 5-1/2 feet of the ground or floor level.
- (6) Where floor openings are used to drop materials from one level to another, audible warning systems must be installed and used to indicate to employees on the lower level when material is dropped.
- (7) Every skylight opening and hole must be guarded by a standard skylight screen or a fixed standard railing on all exposed sides.
- (8) Every infrequently used pit and trapdoor floor opening must be guarded by a floor opening cover of standard strength and construction that should be hinged in place. When the cover is not in place, the pit or trap opening must be constantly attended or protected on all exposed sides by removable standard railings.
- (9) Every manhole floor opening must be guarded by a standard manhole cover. The manhole cover may be left unhinged. When the cover is removed, the manhole opening must be constantly attended or protected by removable standard railings.
- (10) Every temporary floor opening must have standard railings or must be constantly attended.
- (11) Every floor hole that people can accidentally walk into must be guarded by either:
 - (a) A standard railing with standard toeboard on all exposed sides; or
 - (b) A floor hole cover of standard strength and construction that should be hinged in place. While the cover is not in place, the floor hole must be constantly attended or protected by a removable standard railing.
- (12) Every floor hole surrounded by fixed machinery, equipment, or walls that prevent people from walking into it, must be protected by a cover that leaves openings a maximum of one inch wide. The cover must be securely held in place to prevent tools or materials from falling through.
- (13) Where doors or gates open directly on a stairway, a platform must be provided so that the swing of the door does not reduce the platform width to less than 20 inches.

[Recodified as § 296-307-25009. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-25009, filed 10/31/96, effective 12/1/96.]

WAC 296-307-25012 What protection must an employer provide for wall openings and holes?

- (1) Every wall opening from which there is a drop of more than 4 feet must be guarded by one of the following:
 - (a) A rail, roller, picket fence, half door, or equivalent barrier.

WAC 296-307-25012 (Cont.)

The guard may be removable but should be hinged or mounted so it can be easily replaced. When employees working below the opening are exposed to falling materials, a removable toeboard or the equivalent must also be provided. When the opening is unused, the guard must be kept in position even with a door on the opening. In addition, a grab handle must be provided on each side of the opening with its center approximately 4 feet above floor level and of standard strength and mounting.

- (b) An extension platform onto which materials can be hoisted for handling, and that has side rails or equivalent guards of standard specifications.
- (2) Every chute wall opening from which there is a drop of more than 4 feet must be guarded according to subsection (1) of this section or as required by the conditions.
- (3) Every window wall opening at a stairway landing, floor, platform, or balcony, from which there is a drop of more than 4 feet, and where the bottom of the opening is less than 3 feet above the platform or landing, must be guarded by standard slats, standard grillwork according to WAC 296-307-25042(3), or a standard railing.

Where the window opening is below the landing, or platform, a standard toeboard must be provided.

- (4) Every temporary wall opening must have adequate guards that may be of less than standard construction.
- (5) Where there is a hazard of materials falling through a wall hole, and the lower edge of the near side of the hole is less than 4 inches above the floor, and the far side of the hole is more than 5 feet above the next lower level, the hole must be protected by a standard toeboard or a solid enclosing screen, or according to WAC 296-307-25042(3).

[Statutory Authority: Chapter 49.17.040 RCW. 98-24-096 (Order 98-13), § 296-307-25012, filed 12/01/98, effective 03/01/99.
[Recodified as § 296-307-25012. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-25012, filed 10/31/96, effective 12/1/96.]

WAC 296-307-25015 What protection must an employer provide for open-sided floors, platforms, and runways?

- (1) Every open-sided floor or platform 4 feet or more above an adjacent floor or ground level must be guarded by a standard railing (or the equivalent according to WAC 296-307-25027 on all open sides, except where there is an entrance to a ramp, stairway, or fixed ladder. The railing must have a toeboard wherever, beneath the open sides:
 - (a) A person can pass; or
 - (b) There is moving machinery; or
 - (c) Materials falling onto equipment would create a hazard.
- (2) Every runway must be guarded by a standard railing (or the equivalent according to WAC 296-307-25027) on all open sides that are 4 feet or more above floor or ground level. Wherever tools, machine parts, or materials are likely to be used on the runway, a toeboard must also be provided on each exposed side.

Runways used exclusively for special purposes (such as oiling, shafting, or filling tank cars) may have the railing on one side omitted when operating conditions require, if the hazard is minimized by using a runway at least 18 inches wide. Where people entering runways become exposed to machinery, electrical equipment, or hazards other than from falling, additional guarding may be necessary.

WAC 296-307-25015 (Cont.)

- (3) Regardless of height, all open-sided floors, walkways, platforms, or runways above or adjacent to dangerous equipment, pickling or galvanizing tanks, degreasing units, or similar hazardous equipment, must be guarded with a standard railing and toeboard.

- (4) Tools and loose materials must not be left on overhead platforms and scaffolds.

[Statutory Authority: Chapter 49.17.040 RCW. 98-24-096 (Order 98-13), § 296-307-25015, filed 12/01/98, effective 03/01/99.

[Recodified as § 296-307-25015. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-25015, filed 10/31/96, effective 12/1/96.]

WAC 296-307-25018 What requirements apply to stairway railings and guards?

- (1) Every flight of stairs having four or more risers must have standard stair railings or standard handrails as follows (stairway widths measured clear of all obstructions except handrails):
- (a) Stairways less than 44 inches wide with both sides enclosed must have at least one handrail, preferably on the right side descending.
 - (b) Stairways less than 44 inches wide with one side open must have at least one stair railing on the open side.
 - (c) Stairways less than 44 inches wide with both sides open must have one stair railing on each side.
 - (d) Stairways more than 44 inches wide but less than 88 inches wide must have one handrail on each enclosed side and one stair railing on each open side.
 - (e) Stairways 88 or more inches wide must have one handrail on each enclosed side, one stair railing on each open side, and one intermediate stair railing at the approximate middle.

Exception: Vehicle service pit stairways are exempt from this requirement if hand or stair rails would prevent vehicle movement into position over the pit.

- (2) Winding stairs must have a handrail that prevents walking on all portions of the treads that are less than 6 inches wide.
- (3) Nonindustrial and “monumental” steps are exempt from the requirements of this section. However, public and private building steps at loading or receiving docks, in maintenance areas, etc., and stairs used exclusively by employees, must meet the requirements of this section.

[Recodified as § 296-307-25018. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-25018, filed 10/31/96, effective 12/1/96.]

WAC 296-307-25021 How must a standard railing be constructed? A standard railing must meet the following requirements:

- (1) The railing has a top rail, intermediate rail, and posts.
- (2) The railing height is between thirty-six and forty-two inches nominal from the upper surface of the top rail to the floor, platform, runway, or ramp level.
- (3) The top rail is smooth.
- (4) The intermediate rail is approximately halfway between the top rail and the floor, platform, runway, or ramp.

WAC 296-307-25021 (Cont.)

- (5) The ends of the rails do not overhang the terminal posts except where the overhang does not create a hazard.
- (6) Guardrails taller than 42 inches are constructed so they do not create a hazard. Additional mid-rails are installed so that openings beneath the top rail prevent a spherical object with a 19-inch or larger diameter from falling through.

[Recodified as § 296-307-25021. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-25021, filed 10/31/96, effective 12/1/96.]

WAC 296-307-25024 How must a stair railing be constructed? A stair railing must be constructed similar to a standard railing. The stair railing must be between 34 and 30 inches tall measured from the top of the top rail to the tread surface meeting the face of the riser at the forward edge of the tread.

[Recodified as § 296-307-25024. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-25024, filed 10/31/96, effective 12/1/96.]

WAC 296-307-25027 What are the requirements for railing dimensions? Standard railings must meet the following requirements:

- (1) For wood railings:
 - (a) The posts are of at least two inch by four inch nominal stock spaced six feet apart or less; and
 - (b) The top and intermediate rails are of at least two inch by four inch nominal stock.
 - (c) If the top rail is made of two right-angle pieces of 1-inch by 4-inch stock, posts are spaced on 8-foot centers, with 2-inch by 4-inch intermediate rail.
- (2) For pipe railings:
 - (a) The posts and top and intermediate railings are at least 1-1/2 inches nominal diameter (outside diameter); and
 - (b) The posts are spaced on centers of eight feet or less.
- (3) For structural steel railings:
 - (a) The posts and top and intermediate rails are of 2-inch by 2-inch by 3/8-inch angles or other metal shapes of equivalent bending strength; and
 - (b) The posts are spaced on centers of eight feet or less.
- (4) Post anchors and framing parts for all railings are constructed so that the completed structure can withstand a load of at least two hundred pounds applied in any direction at any point on the top rail.
- (5) Other types, sizes, and arrangements of railing construction that meet the following requirements are acceptable:
 - (a) The top rail is smooth;
 - (b) The top rail is between thirty-six and forty-two inches nominal above the floor, platform, runway, or ramp level;
 - (c) The railing is strong enough to withstand two hundred pounds of pressure on the top rail;

WAC 296-307-25027 (Cont.)

- (d) The railing provides protection between the top rail and the floor, platform, runway, ramp, or stair treads, equivalent to that of a standard intermediate rail;
- (e) There are no overhanging rail ends unless the overhang does not create a hazard; such as baluster railings, scrollwork railings, or paneled railings.

Note: The dimensions specified are based on the U.S. Department of Agriculture Wood Handbook, No. 72, 1955 (No. 1 (S4S) Southern Yellow Pine (Modulus of Rupture 7,400 psi)) for wood; ANSI G 41.5-1970, American National Standard Specifications for Structural Steel, for structural steel; and ANSI B 125.1-1970, American National Standard Specifications for Welded and Steamless Steel Pipe, for pipe.

[Recodified as § 296-307-25027. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-25027, filed 10/31/96, effective 12/1/96.]

WAC 296-307-25030 What requirements apply to toeboards?

- (1) Standard toeboard height is at least four inches nominal from its top edge to the level of the floor, platform, runway, or ramp. The toeboard must be securely fastened in place and with a maximum of 1/4 inch clearance above floor level. It must be made of any substantial material that is either solid or with openings that are a maximum of one inch in diameter.
- (2) Where material is piled high enough that a standard toeboard does not provide protection, paneling from the floor to the intermediate rail, or to the top rail, must be provided.

[Recodified as § 296-307-25030. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-25030, filed 10/31/96, effective 12/1/96.]

WAC 296-307-25033 How must handrails and railings be constructed?

- (1) A handrail must have a horizontal part mounted directly on a wall or partition by brackets attached to the lower side of the handrail. The brackets must be attached to ensure that there is a smooth surface along the top and both sides of the handrail. The handrail must be rounded or otherwise provide an adequate handhold for anyone grasping it to avoid falling. The ends of the handrail should be turned in to the supporting wall or arranged to prevent a projection hazard.
- (2) Handrails must be a maximum of thirty-four inches high and at least thirty inches from the upper surface of the handrail to the surface of the tread in line with the face of the riser or to the surface of the ramp.
- (3) The size of handrails must be:
 - (a) For hardwood, at least two inches in diameter.
 - (b) For metal pipe, at least 1-1/2 inches in diameter.
- (4) Brackets must be spaced a maximum of eight feet apart.
- (5) Handrail mounting must be strong enough to withstand a load of at least two hundred pounds applied in any direction at any point on the rail.
- (6) All handrails and railings shall have a clearance of at least 1-1/2 inches between the handrail or railing and the wall or any other object.

[Recodified as § 296-307-25033. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-25033, filed 10/31/96, effective 12/1/96.]

WAC 296-307-25036 What materials may be used for floor opening covers? Floor opening covers must be made of any material that meets the following strength requirements:

- (1) Trench or conduit covers and their supports, when located in plant roadways, must be designed to carry a truck rear-axle load of at least 20,000 pounds.
- (2) Manhole covers and their supports, when located in plant roadways, must meet local standard highway requirements if any; otherwise, they must be designed to carry a truck rear-axle of at least 20,000 pounds.
- (3) Other floor opening covers must be made of any material that can carry a truck rear-axle load of at least 20,000 pounds. Covers may project a maximum of one inch above the floor level if all edges are chamfered to a maximum angle with the horizontal of thirty degrees. All hinges, handles, bolts, or other parts must set flush with the floor or cover surface.

[Recodified as § 296-307-25036. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-25036, filed 10/31/96, effective 12/1/96.]

WAC 296-307-25039 How must skylight screens be constructed and mounted? Skylight screens must be constructed and mounted to withstand a load of at least two hundred pounds applied perpendicularly anywhere on the screen. Skylight screen must be constructed and mounted so that, under ordinary loads or impacts, they will not deflect downward enough to break the glass below them. They must be constructed of grillwork with openings a maximum of four inches long or of slatwork with openings a maximum of two inches wide and any length.

[Recodified as § 296-307-25039. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-25039, filed 10/31/96, effective 12/1/96.]

WAC 296-307-25042 What protection must an employer provide for wall openings?

- (1) Wall opening barriers (rails, rollers, picket fences, and half doors) must be constructed and mounted, to withstand a load of at least two hundred pounds applied in any direction (except upward) at any point on the top rail.
- (2) Wall opening grab handles must be at least twelve inches long and must be mounted to give 1-1/2 inches clearance from the side framing of the wall opening. The size, material, and anchoring of the grab handle must form a structure that can withstand a load of at least two hundred pounds applied in any direction at any point of the handle.
- (3) Wall opening screens must be constructed and mounted to withstand a load of at least two hundred pounds applied horizontally anywhere on the near side of the screen. They must be of solid construction, of grillwork with openings a maximum of four inches long, or of slatwork with openings a maximum of two inches wide and any length.

[Recodified as § 296-307-25042. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-25042, filed 10/31/96, effective 12/1/96.]

WAC 296-307-260 Fixed industrial stairs.

[Recodified as § 296-307-260. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-260, filed 10/31/96, effective 12/1/96.]

WAC 296-307-26003 What does this section cover? WAC 296-307-260 covers the safe design and construction of fixed general industrial stairs. Fixed general industrial stairs includes interior and exterior stairs around machinery, tanks, and other equipment, and stairs leading to or from floors, platforms, or pits.

This section does not apply to stairs used for fire exits, to construction operations, to private buildings or residences, or to articulated stairs that are installed on floating roof tanks or on dock facilities, where the angle changes with the rise and fall of the base support.

WAC 296-307-26003 (Cont.)

Stairs of public and private buildings at loading or receiving docks, in maintenance areas, etc., or stairs that are used exclusively by employees, are considered “fixed industrial steps” and must meet these requirements.

[Statutory Authority: Chapter 49.17.040 RCW. 98-24-096 (Order 98-13), § 296-307-26003, filed 12/01/98, effective 03/01/99.
[Recodified as § 296-307-26003. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-26003, filed 10/31/96, effective 12/1/96.]

WAC 296-307-26006 What definitions apply to this section? “Nose or nosing” means the part of a tread projecting beyond the face of the riser immediately below.

“Open riser” means the air space between the treads of stairways without risers.

“Platform” means an extended step or landing breaking a continuous run of stairs.

“Railing” means a vertical barrier erected along exposed sides of stairways and platforms to prevent people from falling. The top part of the railing usually serves as a handrail.

“Rise” means the vertical distance from the top of a tread to the top of the next higher tread.

“Riser” means the upright part of a step at the back of a lower tread and near the leading edge of the next higher tread.

“Stairs or stairway” means a series of steps. A series of steps and landings having three or more risers constitutes stairs or a stairway.

“Tread” means the horizontal part of a step.

“Tread run” means the horizontal distance from the leading edge of a tread to the leading edge of an adjacent tread.

“Tread width” means the horizontal distance from front to back of tread, including nosing.

[Recodified as § 296-307-26006. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-26006, filed 10/31/96, effective 12/1/96.]

WAC 296-307-26009 Where are fixed stairs required? Fixed stairs must be provided for:

- (1) Employee access from one structure level to another where operations require regular travel between levels.
- (2) Employee access to operating platforms on any equipment that requires regular attention during operations.
- (3) Employees that need daily access to elevations, or access at each shift, for purposes such as gauging, inspection, regular maintenance, etc., where:
 - (a) The work may expose employees to acids, caustics, gases, or other harmful substances; or
 - (b) Employees must normally carry tools or equipment by hand.

Note: This section does not prohibit the use of fixed ladders for access to elevated tanks, towers, and similar structures, overhead traveling cranes, etc., where the use of fixed ladders is common practice.

[Recodified as § 296-307-26009. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-26009, filed 10/31/96, effective 12/1/96.]

WAC 296-307-26012 Where are spiral stairs prohibited? Spiral stairways are prohibited except for special limited use and secondary access when a conventional stairway is not practical. Winding stairways may be installed on tanks and similar round structures where the diameter of the structure is a minimum of five feet.

[Recodified as § 296-307-26012. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-26012, filed 10/31/96, effective 12/1/96.]

WAC 296-307-26015 How strong must fixed stairs be? Fixed stairways must be designed and constructed to carry a load of five times the normal live load anticipated, and must be at least strong enough to carry safely a moving concentrated load of 1,000 pounds.

[Recodified as § 296-307-26015. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-26015, filed 10/31/96, effective 12/1/96.]

WAC 296-307-26018 How wide must fixed stairs be? Fixed stairways must be at least 22 inches wide.

[Recodified as § 296-307-26018. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-26018, filed 10/31/96, effective 12/1/96.]

WAC 296-307-26021 What angles may stairways be installed at?

- (1) Fixed stairs must be installed at angles to the horizontal of between thirty and fifty degrees. Any uniform combination of rise/tread dimensions may be used that will provide a stairway at an angle within the permissible range.

The following table lists examples of rise/tread dimensions that will produce a stairway within the permissible range. Rise/tread combinations are not limited to those in the table.

Angle to Horizontal	Rise in (inches)	Tread Run in (inches)
30°35'	6 1/2	11
32°08'	6 3/4	10 3/4
33°41'	7	10 1/2
35°16'	7 1/4	10 1/4
36°52'	7 1/2	10
38°29'	7 3/4	9 3/4
40°08'	8	9 1/2
41°44'	8 1/4	9 1/4
43°22'	8 1/2	9
45°00'	8 3/4	8 3/4
46°38'	9	8 1/2
48°16'	9 1/4	8 1/4
49°54'	9 1/2	8

- (2) A permanent stairway may be installed at an angle above the fifty degree critical angle when space limitations require. Such installations (commonly called inclined ladders or ship's ladders) must have handrails on both sides and open risers. They must be capable of sustaining a live load of one hundred pounds per square foot with a safety factor of four. The following preferred and critical angles from the horizontal are recommended for inclined ladders and ship's ladders:

(a) 35 to 60 degrees-Preferred angle from horizontal.

(b) 60 to 70 degrees-Critical angle from horizontal.

[Recodified as § 296-307-26021. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-26021, filed 10/31/96, effective 12/1/96.]

WAC 296-307-26024 What requirements apply to stair treads?

- (1) When risers are used, each tread and the top landing of a stairway should have a nose extending 1/2 to one inch beyond the face of the lower riser.
- (2) Noses should have an even leading edge.
- (3) All treads must be reasonably slip-resistant and the nosings must be of nonslip finish. Welded bar grating treads without nosings are acceptable if the leading edge can easily be identified by employees descending the stairway and the tread is serrated or is nonslip.
- (4) Rise height and tread width must be uniform throughout any flight of stairs including any foundation structure used as one or more treads of the stairs.

[Recodified as § 296-307-26024. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-26024, filed 10/31/96, effective 12/1/96.]

WAC 296-307-26027 What requirements apply to the length of stairways? Long flights of stairs, unbroken by landings or intermediate platforms, should be avoided. You should consider providing intermediate platforms where practical and for frequently used stairways. Stairway platforms must be at least as wide as the stairway and at least 30 inches long, measured in the direction of travel.

[Recodified as § 296-307-26027. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-26027, filed 10/31/96, effective 12/1/96.]

WAC 296-307-26030 What requirements apply to railings and handrails on fixed stairs? Standard railings must be provided on the open sides of all exposed stairways and stair platforms. Handrails must be provided on at least one side of closed stairways, preferably on the right side descending. Stair railings and handrails must be installed according to WAC 296-307-250.

[Statutory Authority: Chapter 49.17.040 RCW. 98-24-096 (Order 98-13), § 296-307-26030, filed 12/01/98, effective 03/01/99. [Recodified as § 296-307-26030. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-26030, filed 10/31/96, effective 12/1/96.]

WAC 296-307-26033 What requirements apply to alternating tread-type stairs? “Alternating tread-type stairs” means stairs with a series of steps between 50 and 70 degrees from horizontal, attached to a center support rail in an alternating manner so that a user of the stairs never has both feet at the same level at the same time.

- (1) Alternating tread-type stairs must be designed, installed, used, and maintained according to the manufacturer’s specifications, and must have the following:
 - (a) Stair rails on all open sides;
 - (b) Handrails on both sides of enclosed stairs;
 - (c) Stair rails and handrails that provide an adequate handhold for a user grasping it to avoid a fall;
 - (d) A minimum of 17 inches between handrails;
 - (e) A minimum width of 22 inches overall;
 - (f) A minimum tread depth of 8 inches;
 - (g) A minimum tread width of 7 inches; and

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- (h) A maximum rise of 9 1/2 inches to the tread surface of the next alternating tread.
- (2) Alternating tread-type stairs must have a maximum 20-foot continuous rise. Where more than a 20-foot rise is necessary to reach the top of a required stair, one or more intermediate platforms must be provided according to WAC 296-307-26027.
- (3) Stairs and platforms must be installed so the top landing of the alternating tread stair is flush with the top of the landing platform.
- (4) Stair design and construction must sustain a load of at least five times the normal live load, and be at least strong enough to carry safely a moving concentrated load of 1,000 pounds.
- (5) Treads must have slip-resistant surfaces.
- (6) Where a platform or landing is used, the width must be at least as wide as the stair and at least 30-inches deep in the direction of travel. Stairs must be flush with the top of the landing platform.

[Statutory Authority: Chapter 49.17.040 RCW. 98-24-096 (Order 98-13), § 296-307-26033, filed 12/01/98, effective 03/01/99.
[Recodified as § 296-307-26033. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-26033, filed 10/31/96, effective 12/1/96.]

WAC 296-307-26036 What other requirements apply to fixed stairs?

- (1) Vertical clearance above any stair tread to an overhead obstruction must be at least 7 feet measured from the leading edge of the tread.
 - (2) Stairs with treads less than 9 inches wide should have open risers.
 - (3) Open grating type treads are desirable for outside stairs.
- [Recodified as § 296-307-26036. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-26036, filed 10/31/96, effective 12/1/96.]

WAC 296-307-270 Aerial manlift equipment.

[Recodified as § 296-307-270. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-270, filed 10/31/96, effective 12/1/96.]

WAC 296-307-27005 What requirements apply to aerial manlift equipment?

- (1) We will accept safety factor test data on working or structural components from one of the following as evidence that a manlift meets minimum safety requirements:
 - (a) The manufacturer;
 - (b) A competent testing laboratory;
 - (c) A registered engineering firm; or
 - (d) A registered engineer.

If, after use, it appears doubtful whether this equipment will meet the above requirements, we may require that tests be conducted, and we may order that you make corrections.

- (2) All aerial manlifts must have working brake systems.

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- (3) Automatic apertures must be installed in the hydraulic systems of aerial manlifts to maintain the boom in position in case any part of the hydraulic pressure system fails.
- (4) Controls must be guarded by partial enclosures to minimize accidental contact.
- (5) The manufacturer's recommended maximum load limit must be posted conspicuously near the controls and must be kept in a legible condition.
- (6) All critical hydraulic and pneumatic components must meet the provisions of ANSI A92.2-1969, Section 4.9 Bursting Safety Factor. Critical components are those which, in case of failure, would cause a free fall or free rotation of the boom. All noncritical components must have a bursting safety factor of at least two to one.

[Recodified as § 296-307-27005. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-27005, filed 10/31/96, effective 12/1/96.]

WAC 296-307-27010 What requirements apply to using aerial manlift equipment?

- (1) The manufacturer's instructional manual, if any, must be used to establish the proper operational sequences and maintenance procedures. If there is no manual, you must develop instructions. The instructions must be available for reference by operators.
- (2) The assigned operator must make a daily visual inspection and perform the tests recommended by the manufacturer.
- (3) Only employees qualified by training or experience may operate aerial manlifts.
- (4) Employees must report defective aerial manlift equipment to you as soon as identified. Using defective equipment is prohibited when the defect may cause an accident.
- (5) When moving to and from the job site, the basket of the manlift must be in the low position.
- (6) Unsafe practices are prohibited, such as, sitting or standing on the basket edge, standing on material placed across the basket, or working from a ladder set inside the basket.
- (7) The basket must not be rested on a fixed object so that the weight of the boom is supported by the basket.
- (8) The employee and the aerial manlift equipment must maintain distance from high voltage lines according to WAC 296-307-150.

[Statutory Authority: Chapter 49.17.040 RCW. 98-24-096 (Order 98-13), § 296-307-27010, filed 12/01/98, effective 03/01/99. [Recodified as § 296-307-27010. 97-09-013, filed 4/7/97, effective 4/7/97. Statutory Authority: RCW 49.17.040, [49.17.]050 and [49.17.]060. 96-22-048, § 296-306A-27010, filed 10/31/96, effective 12/1/96.]